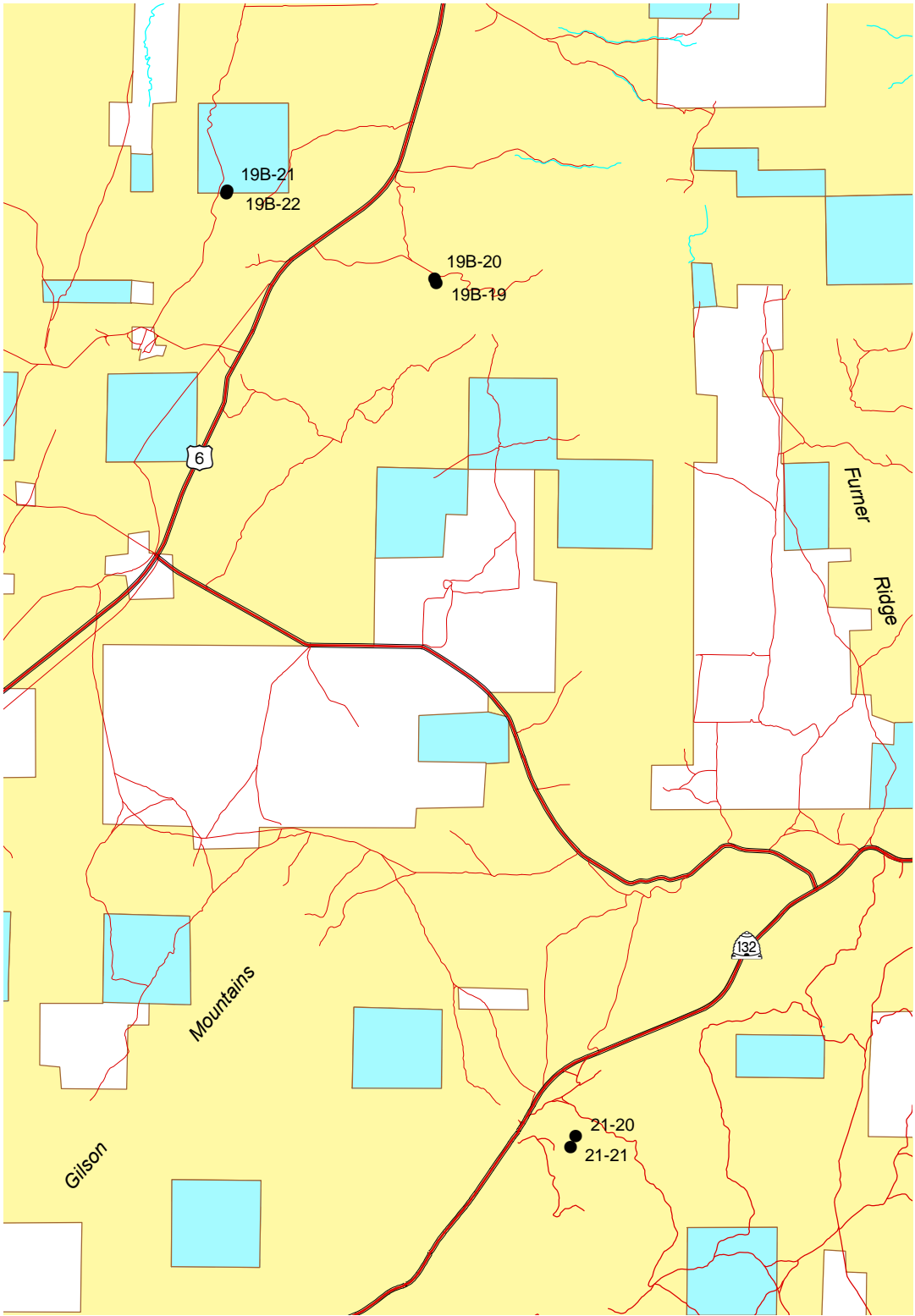


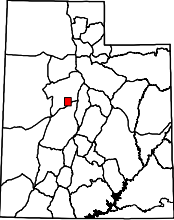
Burn Rehab Treatment Area



Map Scale 1:115,249 (1 inch = 1.8 miles)

Map Location

- BLM
- State of Utah
- Private Land
- Water Body
- Major Road
- Minor Road
- Water Course



Leamington Burn Complex Special Projects

Introduction

In 1996, Utah experienced its most active, extensive, and devastating fire season in history. In Millard and Juab Counties alone, some 250,000 acres were burned. The Leamington complex was the largest burned area covering approximately 138,340 acres of mostly pinyon-juniper woodland. Rehabilitation efforts began in the fall of 1996 which included drilling the more accessible low-lying areas, with the remainder being aerially seeded and one-way chained to cover the seed and enhance establishment of the seeded species. On the Leamington complex, about 6,100 acres were treated with a rangeland drill, 10,736 acres were aerial seeded and one-way chained, and 8,308 acres were aerially seeded only. Aerially seeding and then chaining is an effective method of breaking up burned trees which provide valuable surface litter to help protect the soil from erosion and it enhances seed establishment by covering the seed. This practice was stopped temporarily because of concerns voiced by environmental and Native American groups with regard to archeological resources in the burned areas even though an archeological survey had been completed. During the summer of 1997, two study sites were established, Leamington burn and Leamington burn & chain. One was placed in a burned and seeded area, and the other established in the immediate area where it had been burned, seeded, then chained one-way. Two additional pairs of sites was established in 1998 at Paul Bunyan and near the Jericho sheep shearing sheds to monitor the same treatment effects as the Leamington sites. The purpose of these sites was to monitor the recovery of these areas following rehabilitation using seeding alone compared to seeding and chaining.

Seed Lists

Paul Bunyan Burn (19B-19) and Paul Bunyan Burn & Chain (19B-20)

Aerial Mix

Species	Pounds of Seed	Pounds per acre
High Crest (<i>Agropyron cristatum</i>)	15,100	4.0
Rye (<i>Elymus junceus</i>)	11,350	3.0
Tall wheatgrass (<i>Agropyron elongatum</i>)	7,500	2.0

Dribbler Mix

Fourwing saltbush (<i>Atriplex canescens</i>)	3,800	1.0
---	-------	-----

Jericho State Section (19B-21)

Aerial Mix

Species	Pounds per acre
High Crest (<i>Agropyron cristatum</i>)	5
Intermediate Wheatgrass (<i>Agropyron intermedium</i>)	3
Alfalfa (<i>Medicago sativa</i>)	1
Yellow Sweet Clover (<i>Melilotus officinalis</i>)	0.5

Jericho BLM (19B-22)

Aerial Mix

Species	Pounds of Seed	Pounds per acre
High Crest (<i>Agropyron cristatum</i>)	6,550	3.1
Rye (<i>Elymus junceus</i>)	4,400	2.1
Tall wheatgrass (<i>Agropyron elongatum</i>)	4,250	2.0
Smooth Brome (<i>Bromus inermis</i>)	4,000	1.9

Dribbler Mix

Fourwing saltbush (<i>Atriplex canescens</i>)	2,150	1.0
---	-------	-----

Leamington Burn (21-20) and Leamington Burn & Chain (21-21)

Aerial Mix

Species	Pounds of seed	lbs/acre
High Crest (<i>Agropyron cristatum</i>)	12,450	3.3
Rye (<i>Elymus junceus</i>)	12,450	3.3
Tall wheatgrass (<i>Agropyron elongatum</i>)	8,300	2.2
Great Basin Wildrye (<i>Elymus cinereus</i>)	2,000	0.53
Smooth brome (<i>Bromus inermis</i>)	600	0.16
Alfalfa (<i>Medicago sativa</i>)	1,200	0.32
Small burnet (<i>Sanguisorba minor</i>)	500	0.13

Dribbler Mix

Fourwing saltbush (<i>Atriplex canescens</i>)	3,700	1.0
---	-------	-----

Trend Study 19B-21-02

Study site name: Jericho State Section.

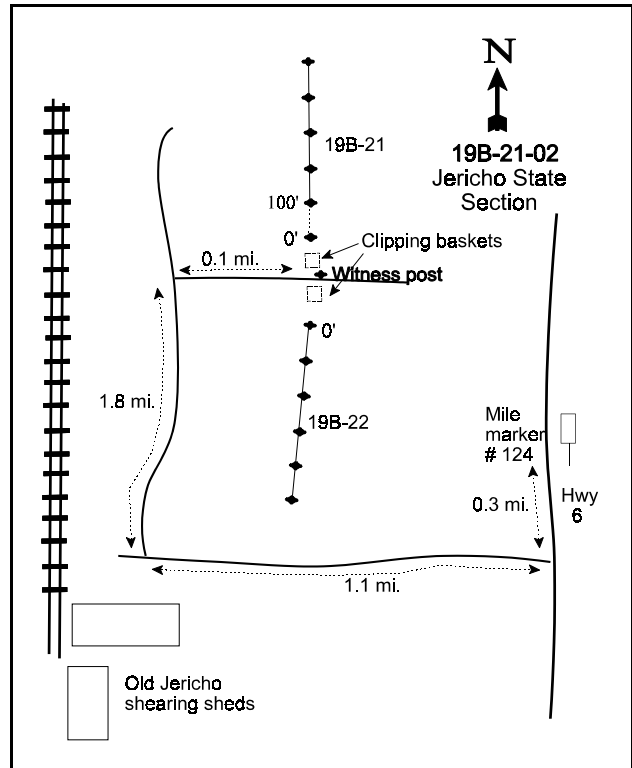
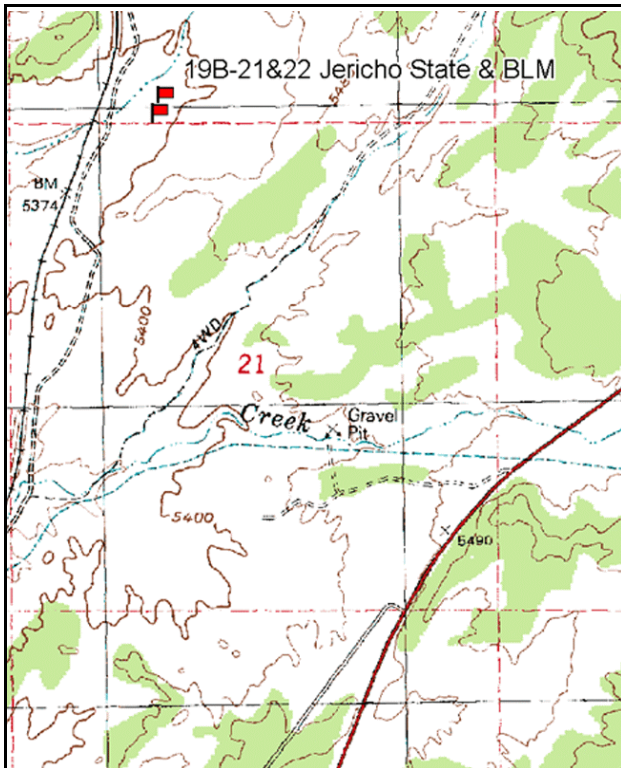
Vegetation type: Burn.

Compass bearing: frequency baseline 0 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From mile marker 124 on Hwy 6, drive 0.3 miles south to a road heading west. Take this road for 1.1 miles to the old Jericho shearing sheds on the left and an intersection before the railroad tracks. Turn right and follow the road on the east side of the tracks for 1.8 miles. At this point is the border of state land and BLM land. Park here and walk for 0.1 miles to a witness post and some clipping baskets. The 0-foot stake is 100 feet directly north of the witness post.



Map Name: McIntyre

Diagrammatic Sketch

Township 12S, Range 3W, Section 16

GPS: NAD 27, UTM 12S 4403003 N, 398199 E

DISCUSSION

Jericho State Section - Trend Study No. 19B-21

This study is located in Tintic Valley west of U.S. Highway 6, and north of the old Jericho sheep shearing sheds. It samples a burned sagebrush flat just east of the railroad tracks. The area was part of the extensive Leamington burn complex of 1996. The site is nearly level with a slight southwest aspect. Elevation is approximately 5,400 feet. The site once supported a dense stand of basin big sagebrush. The fire burned very hot and eliminated all of the sagebrush from the site. Burned sagebrush stems, counted in 1998, provide an estimated pre-burn density of 5,600 plants/acre. Low hills surround the site which once contained a mixture of sagebrush and juniper. This study samples a section of land owned by the State of Utah that was aerially seeded with crested wheatgrass, intermediate wheatgrass, alfalfa, and yellow sweet clover after the fire. The site was not chained to cover the seed. In 1998, pellet group data demonstrated little rabbit use and sign of only a few trespass cattle. A pellet group transect read on site in 2002 estimated 64 sheep days use/acre (159 sdu/ha). No wildlife droppings were sampled in the transect, deer pellets were sampled in only three quadrats.

Soil on the site is fairly deep with an effective rooting depth of 16 inches. Texture is a loam with very little rock or pavement on the surface. Rock is also uncommon in the soil profile. The soil is neutral in reactivity with a pH of 7.1. Soil temperature was quite high averaging 67°F at a depth of almost 18 inches in 1998. Phosphorus may be limiting at only 3.8 ppm as 10 ppm is thought to be minimal for normal plant growth and development. Bare ground was abundant in both 1998 and 2002 averaging almost 60% over the site. In 1998, the soil surface had large cracks present indicating the existence of shrink-swell clays. This surface characteristic likely enhanced the establishment of seeded grasses and forbs by providing safe sites for establishment. Erosion is not a problem on the site due to the abundant herbaceous cover combined with the nearly level terrain. Some shallow gullies found on the site indicate some erosion occurred in the past but these channels are now filled with grasses and forbs. The erosion condition class was determined as stable in 2002.

Following the wildfire, no surviving shrubs have been sampled on the site, and none were included within the seed mix. Unless another treatment is done to seed shrubs into the site, this area will likely be devoid of browse for the distant future.

In 1998, the herbaceous understory consisted of nearly equal amounts of grasses and forbs. Both classes of plants provided over 20% average cover on the site. Grass composition is dominated by seeded grasses, primarily crested wheatgrass. Intermediate wheatgrass was also abundant in 1998, but has significantly decreased in both frequency and cover since. Cheatgrass brome, which was abundant in 1998, decreased significantly in nested frequency and cover in 2002 due to drought and an increasing perennial grass component. Native grasses include western wheatgrass, Indian ricegrass, and bottlebrush squirreltail, but all occur infrequently.

The forb component has low diversity. Two species, yellow sweet clover and alfalfa, totally dominated the forb component in 1998 by providing 94% of the forb cover. These plants were large and very vigorous. In 1998, grasshoppers were abundant on the site and had apparently selectively eaten all of the yellow sweet clover leaves, while alfalfa was not utilized. In 2002, yellow sweet clover was not sampled, while alfalfa remained stable in nested frequency, but declined in cover by nearly one-half (12% to 7%). Perennial grasses and forbs declined in sum of nested frequency in 2002 with much of this being attributed to drought conditions. Mormon crickets were also abundant on the site in 2002, and were noted as having heavily utilized the alfalfa on the site.

1998 APPARENT TREND ASSESSMENT

The soil appears stable with no apparent erosion occurring. Trend for soil will improve with increased litter and vegetative cover. There are no shrubs on the site or in the general vicinity except on the adjacent Jericho BLM site (19B-21) which was seeded with fourwing saltbush. Shrubs will take many years to establish on the site due to a lack of a nearby seed source. The herbaceous understory is well established with an almost equal amount of grass and forb cover. Seeded grasses are abundant and will likely increase in the few next years until competition becomes more acute. The composition of forbs will likely change in a few years as yellow sweet clover, a short-lived biannual forb, becomes less abundant. However, alfalfa appears to be well established and should persist unless subjected to overutilization by livestock. The abundance of perennial grasses and forbs appears to be keeping cheatgrass suppressed. Nested frequency is fairly high at 247, but cover is only 6%.

2002 TREND ASSESSMENT

Trend for soil is stable. Bare ground remains very high at nearly 60%. Vegetative cover decreased, but litter cover increased by nearly the same magnitude. Erosion is low and the small gullies throughout the site are not active. There is no browse trend for this site as this component is non-existent. The herbaceous understory has a slightly downward trend. Sum of nested frequency for perennial grasses slightly declined, while that of perennial forbs is only about one-half of the 1998 level. The drastic decline in forbs is not surprising with the drought, and occurred on most of the sites in the Vernon management unit in 2002 combined with utilization by Mormon crickets. As was reported in 1998, yellow sweet clover, a short-lived species, was not sampled in 2002. Alfalfa remains stable in frequency, but had greatly reduced vigor due to drought and conditions.

TREND ASSESSMENT

soil - stable (3)

browse - N/A

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 19B, Study no: 21

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'98	'02	'98	'02	'98	'02
G	Agropyron cristatum	250	292	78	89	9.84	15.13
G	Agropyron intermedium	_b 159	_a 41	58	19	6.69	1.22
G	Agropyron smithii	_a -	_b 45	-	18	-	.27
G	Bromus tectorum (a)	_b 247	_a 37	69	16	5.99	.47
G	Elymus junceus	-	5	-	2	-	.30
G	Oryzopsis hymenoides	4	6	1	3	.03	.33
G	Sitanion hystrix	_b 18	_a -	10	-	.79	-
Total for Annual Grasses		247	37	69	16	5.99	0.47
Total for Perennial Grasses		431	389	147	131	17.36	17.26
Total for Grasses		678	426	216	147	23.35	17.74

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'98	'02	'98	'02	'98	'02
F	Alyssum desertorum (a)	13	10	4	5	.19	.02
F	Astragalus spp.	3	-	1	-	.03	-
F	Descurainia pinnata (a)	3	-	1	-	.00	-
F	Erigeron spp.	2	-	2	-	.15	-
F	Melilotus officinalis	_b 93	_a -	40	-	8.05	-
F	Medicago sativa	175	164	76	66	12.24	6.72
F	Phlox hoodii	2	-	1	-	.15	-
F	Phlox longifolia	2	-	1	-	.03	-
F	Potentilla gracilis	1	-	1	-	.15	-
F	Sisymbrium altissimum (a)	10	-	4	-	.49	-
F	Sphaeralcea coccinea	2	2	2	2	.03	.01
Total for Annual Forbs		26	10	9	5	0.68	0.02
Total for Perennial Forbs		280	166	124	68	20.84	6.73
Total for Forbs		306	176	133	73	21.53	6.75

Values with different subscript letters are significantly different at alpha = 0.10

BASIC COVER --

Herd unit 19B, Study no: 21

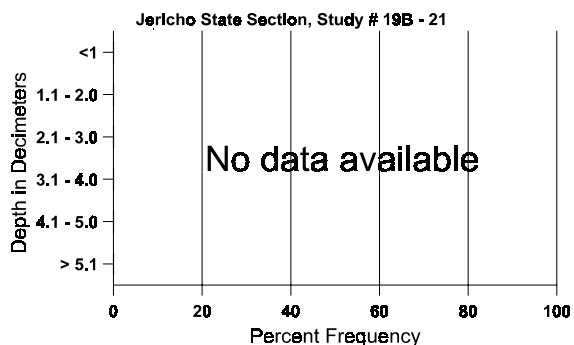
Cover Type	Nested Frequency		Average Cover %	
	'98	'02	'98	'02
Vegetation	429	355	41.50	26.00
Rock	33	15	.13	.06
Pavement	219	272	.80	.84
Litter	468	478	10.19	27.91
Cryptogams	-	64	0	.31
Bare Ground	456	465	56.47	59.64

SOIL ANALYSIS DATA --

Herd Unit 19B, Study no: 21, Jericho State Section

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
16.1	67.0 (17.5)	7.1	44.0	31.1	24.9	0.9	3.8	278.4	0.6

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 19B, Study no: 21

Type	Quadrat Frequency		Pellet Groups per Acre	Days Use per Acre (ha)
	'98	'02	'02	'02
Sheep	-	16	835	64 (159)
Rabbit	2	2	-	-
Deer	-	3	-	-

BROWSE CHARACTERISTICS --

Herd unit 19B, Study no: 21

Artemisia tridentata tridentata																	
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	5600		280
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'98		00%			00%			00%									
'02		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)														'98	0	Dec:	-
														'02	0		-
Opuntia spp.																	
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'98		00%			00%			00%									
'02		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)														'98	0	Dec:	-
														'02	0		-

Trend Study 19B-22-02

Study site name: Jericho BLM.

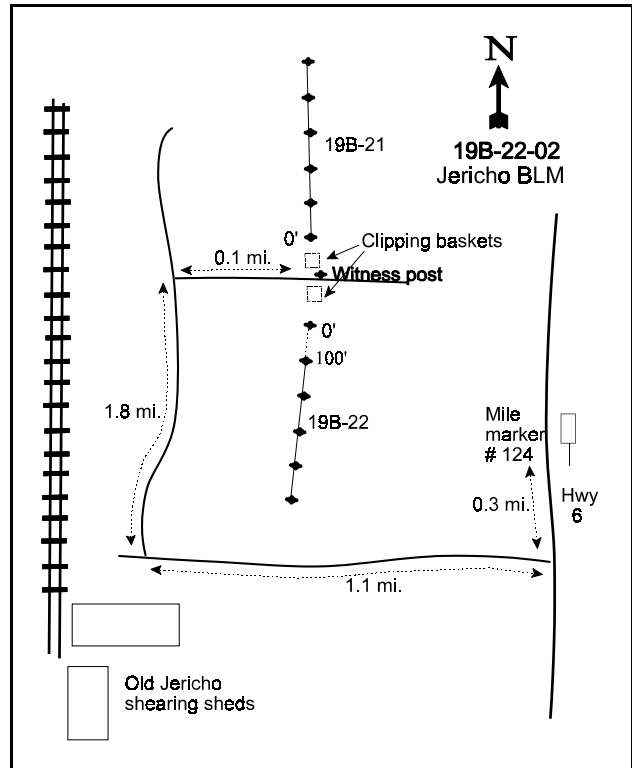
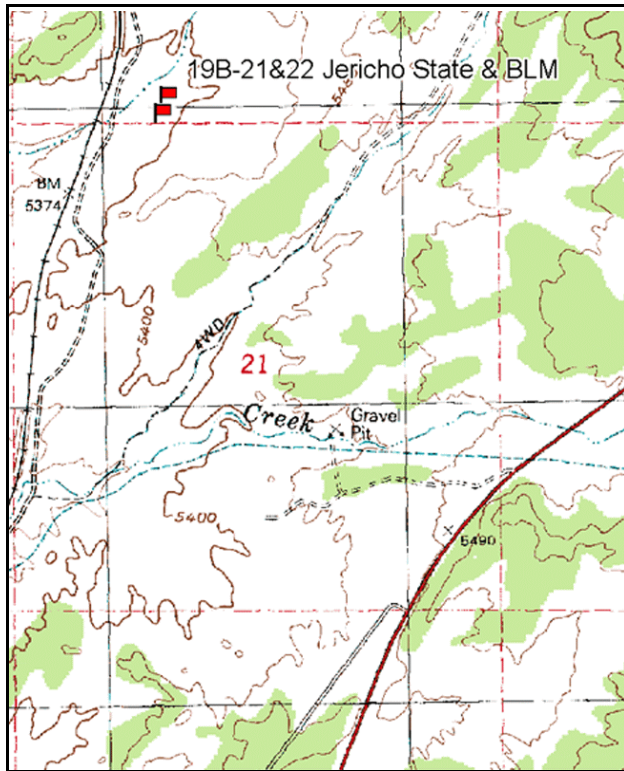
Vegetation type: Burn.

Compass bearing: frequency baseline 0 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From mile marker 124 on Hwy 6, drive 0.3 miles south to a road heading west. Take this road for 1.1 miles to the old Jericho shearing sheds on the left and an intersection before the railroad tracks. Turn right and follow the road on the east side of the tracks for 1.8 miles. At this point is the border of state land and BLM land. Turn right and follow the faint road along the border for 0.1 miles to a witness post and some clipping baskets. The 0-foot stake is 100 feet at 192 degrees magnetic from the witness post. The 0-foot stake has browse tag #475.



Map Name: McIntyre

Diagrammatic Sketch

Township 12S, Range 3W, Section 16

GPS: NAD 27, UTM 12S 4402945 N 398178 E

DISCUSSION

Jericho BLM - Trend Study No. 19B-22

This study samples the same sagebrush flat as study 19B-21. The baseline begins about 200 feet south of the Jericho State Section baseline stake. Terrain is nearly level with a slight southwest aspect. Elevation is approximately 5,400 feet. This site was part of the Leamington wildfire burn complex that burned thousands of acres in 1996. This transect samples an area that was aerially seeded and then one-way chained with an Ely chain to enhance establishment of seeded species. The seed mix consisted of four exotic perennial grasses and one shrub, fourwing saltbush. The fourwing seed was applied with a seed dribbler which dropped seeds on the bulldozer tracks during the chaining. The 1998 pellet group transect encountered only one deer pellet group and a few trespass cattle pats. Pellet group transect data collected in 2002 estimated 35 sheep days use/acre (88 sdu/ha). Deer pellets were sampled in only three quadrats in 2002.

Soil on this site is very similar to the unchained site (19B-21). Effective rooting depth was estimated at almost 18 inches with little rock or pavement on the surface or within the profile. Soil texture is a loam with a neutral pH (7.3). Percent organic matter is 2½ times higher than on the unchained site. Phosphorus is low at only 4 ppm and can be limiting to plant growth and development where 10 ppm is considered minimal for normal plant growth and development. Bare ground was abundant in 1998 and 2002 at 50% and 56% respectively. The erosion condition class was determined to be stable to slight in 2002. Severe pedestalling around the base of bunchgrasses provides most of the evidence of past erosion.

The site once supported a dense stand of basin big sagebrush. Counts of burned stems on this site estimated a pre-burn sagebrush density of 2,640 plants/acre. The chaining obviously disturbed the ground surface and probably skewed the sample. No live sagebrush plants have been sampled following the burn. The seeded shrub, fourwing saltbush, had an estimated density of 400 plants/acre in 1998, decreasing to 200 plants/acre in 2002. Much of the decline in density was due to the loss of the young age class in 2002, although 60 dead plants/acre were also sampled. Vigor was normal and no decadent plants were sampled in 1998, but in 2002, 80% of the population was decadent and the same proportion displayed poor vigor. Sheep had utilized the fourwing on the site in 2002. These negative trends are drought induced and will hopefully reverse with better precipitation in the future. This sparse population of fourwing saltbush cannot afford further losses or it may disappear altogether. The only other browse sampled in 2002 was pricklypear cactus at an estimated 20 plants/acre.

This site received a seed mix of only exotic perennial grasses which established very well. Tall wheatgrass was the most abundant herbaceous species in 1998, followed by crested wheatgrass, Russian wildrye, and smooth brome. Tall wheatgrass decreased in both nested frequency and average cover in 2002, but still remains the second most abundant grass. Crested wheatgrass significantly increased in nested frequency and doubled in cover between the 1998 and 2002 readings. Western wheatgrass, a rhizomatous native, was not sampled in 1998, but occurred in 33 quadrats in 2002. Other native perennials include bluebunch wheatgrass, Indian ricegrass, and bottlebrush squirreltail. Cheatgrass was very abundant in 1998 with a nested frequency value of 334 and a quadrat frequency of 94%. Cheatgrass occurred primarily in patches where perennial grasses did not establish well. In 2002, cheatgrass significantly declined in frequency and cover. The decline in cheatgrass is due to the combination of two factors, drought in 2002 and an increasing and highly competitive perennial grass component.

Forbs were rare in both sampling years with only three annual and four perennial species being encountered. The annuals, pale alyssum and tumble mustard, provided nearly all of the forb cover in 1998. Forbs will probably never be a significant component on this site unless seeded into the site sometime in the future. It was noted that there were fewer crickets on this transect compared to the Jericho State Section transect in 2002, probably due to the lack of forbs.

1998 APPARENT TREND ASSESSMENT

The soil trend appears stable with abundant and well dispersed vegetative cover. The trend will improve in the future as vegetation and litter cover increase. The only shrub on the site is fourwing saltbush which was seeded with a dribbler. It appears to have established in sufficient numbers to maintain itself and probably increase in the future. Currently, there are an estimated 400 plants/acre, 75% of which were classified as young. The herbaceous understory is dominated by seeded perennial grasses which appear to be well established. Cheatgrass is present and occurs in dense patches, but only where perennial grasses did not establish in good numbers. Overall, cheatgrass accounts for only 29% of the grass cover. It will likely not increase as long as the site is not over-grazed in the spring. Forbs are scarce and the composition is poor with two annuals providing nearly all of the forb cover.

2002 TREND ASSESSMENT

Trend for soil is slightly down. Soils are in less than ideal condition with an abundance of bare soils and moderately low levels of vegetation and litter cover. The decline in cheatgrass in 2002 accounts for most of the decrease in vegetative cover. A positive trend is the increase in sum of nested frequency for perennial grasses. The erosion condition class borders on the stable and slight categories in 2002. Trend for browse is down. Although the population of fourwing saltbush appeared vigorous and in a high enough density to increase on the site in 1998, fourwing has declined in density. It had very high decadence and poor vigor estimates (80%) in 2002. There were no young plants sampled in 2002. Drought conditions are the most responsible for these downward trends. Hopefully better precipitation in the future will reverse the direction of fourwing future trends. Further losses in density may take the entire population out of the site for good. The herbaceous understory has a slightly upward trend. Perennial grasses increased in sum of nested frequency overall. Primary and secondary dominance switched between tall and crested wheatgrass between 1998 and 2002, but both provide about equal stabilization and forage value on the site. Cheatgrass drastically declined in 2002 with drought. With perennials increasing at the present time, it appears that cheatgrass will be held in check in the future.

TREND ASSESSMENT

soil - slightly down (2)

browse - down (1)

herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --

Herd unit 19B, Study no: 22

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'98	'02	'98	'02	'98	'02
G	Agropyron cristatum	_a 133	_b 193	57	67	5.14	10.33
G	Agropyron intermedium	_b 198	_a 108	70	45	14.29	7.15
G	Agropyron smithii	_a -	_b 87	-	33	-	1.35
G	Agropyron spicatum	-	5	-	1	-	.15
G	Bromus inermis	35	46	17	19	1.29	.51
G	Bromus tectorum (a)	_b 334	_a 14	94	7	9.84	.06
G	Elymus junceus	35	35	16	15	1.79	1.83
G	Oryzopsis hymenoides	-	-	-	-	.00	-
G	Sitanion hystrix	31	21	13	8	1.79	.48
Total for Annual Grasses		334	14	94	7	9.84	0.06
Total for Perennial Grasses		432	495	173	188	24.32	21.83
Total for Grasses		766	509	267	195	34.17	21.89
F	Agoseris glauca	3	-	1	-	.00	-
F	Alyssum desertorum (a)	_b 87	_a 13	30	6	.62	.03
F	Calochortus nuttallii	2	-	1	-	.00	-
F	Descurainia pinnata (a)	4	-	1	-	.01	-
F	Senecio multilobatus	1	-	1	-	.00	-
F	Sisymbrium altissimum (a)	_b 33	_a 2	15	1	1.91	.00
F	Sphaeralcea grossulariaefolia	-	1	-	1	.00	.00
Total for Annual Forbs		124	15	46	7	2.54	0.03
Total for Perennial Forbs		6	1	3	1	0.01	0.00
Total for Forbs		130	16	49	8	2.56	0.03

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Herd unit 19B, Study no: 22

T y p e	Species	Strip Frequency		Average Cover %	
		'98	'02	'98	'02
B	Atriplex canescens	16	9	.33	.58
B	Opuntia spp.	0	1	-	-
Total for Browse		16	10	0.32	0.58

BASIC COVER --

Herd unit 19B, Study no: 22

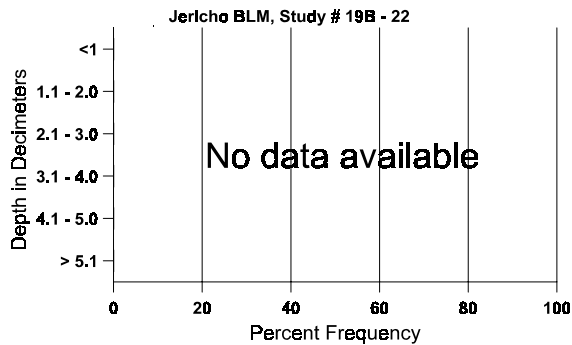
Cover Type	Nested Frequency		Average Cover %	
	'98	'02	'98	'02
Vegetation	413	336	39.77	24.76
Rock	32	37	.11	.12
Pavement	289	240	2.41	2.14
Litter	484	461	14.53	26.26
Cryptogams	-	32	0	.04
Bare Ground	459	456	49.61	56.15

SOIL ANALYSIS DATA --

Herd Unit 19B, Study no: 22, Jericho BLM

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
17.5	67.4 (17.7)	7.3	44.0	30.1	25.9	2.5	4.0	364.8	0.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 19B, Study no: 22

Type	Quadrat Frequency		Pellet Groups per Acre '02	Days Use per Acre (ha) '02
	'98	'02		
Sheep	-	17	461	35 (88)
Rabbit	1	4	-	-
Deer	-	3	-	-

BROWSE CHARACTERISTICS --

Herd unit 19B, Study no: 22

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata tridentata																		
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	2640		132	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'98		00%			00%			00%										
'02		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'98	0	Dec:	-			
												'02	0		-			
Atriplex canescens																		
Y	98	15	-	-	-	-	-	-	-	-	15	-	-	-	300		15	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	98	5	-	-	-	-	-	-	-	-	5	-	-	-	100	17	17	
	02	1	-	1	-	-	-	-	-	-	2	-	-	-	40	26	37	
D	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	3	1	1	-	-	1	2	-	-	-	-	-	8	160		8	
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'98		00%			00%			00%			-50%							
'02		10%			30%			80%										
Total Plants/Acre (excluding Dead & Seedlings)												'98	400	Dec:	0%			
												'02	200		80%			
Opuntia spp.																		
M	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	3	
D	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	-	-	-	1	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'98		00%			00%			00%										
'02		00%			00%			100%										
Total Plants/Acre (excluding Dead & Seedlings)												'98	0	Dec:	0%			
												'02	20		100%			

Summary and Comparison of Jericho State Section (19B-21) and Jericho BLM (19B-22)

Studies 19B-21 and 19B-22 were established in 1998 to monitor the recovery of the vegetation community on two treatments following the Leamington wildfire complex that burned through the area in 1996. Study 19B-21 was seeded only, while study 19B-22 was seeded and then one-way chained. These studies were paired to compare differences in restoration efforts between seeding only (19B-21) and seeding followed by one-way chaining (19B-22) to cover the seed and enhance establishment of the seeded species. Seed mixes were not identical however, for the Jericho State Section included yellow sweet clover and alfalfa in its seed mix.

Perennial grasses are the key component in the vegetation community on the Jericho sites. During the initial reading in 1998, perennial grasses had a nearly identical sum of nested frequency value on both sites, although percent cover was higher on the BLM site which was chained following seeding (Figures 1 and 2). In 2002, five years following the treatments, both sum of nested frequency and percent cover of perennial grasses were higher on the BLM site compared to the state section which was seeded but not chained.

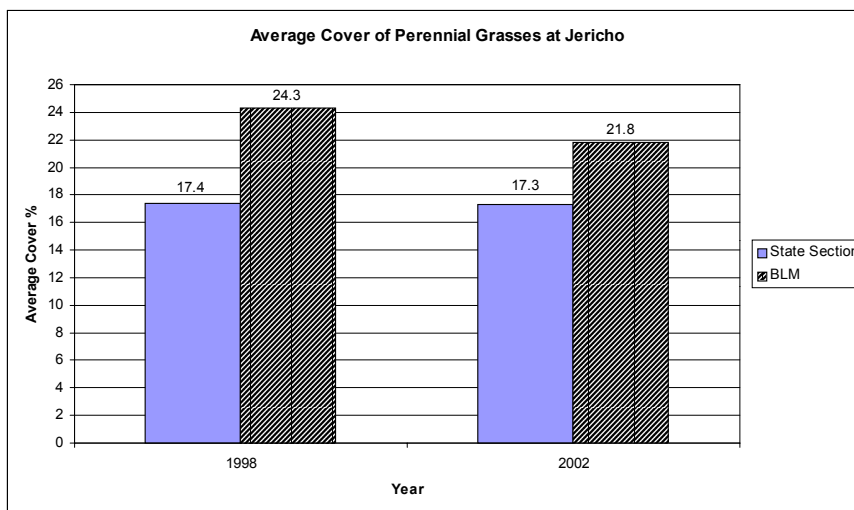


Figure 1. A comparison of percent cover values for perennial grasses from 1998-2002 on the Jericho fire rehabilitation studies.

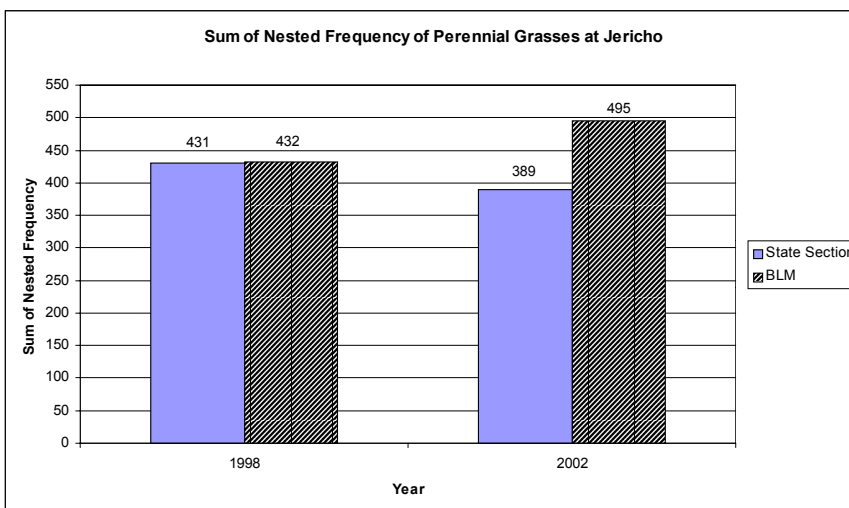


Figure 2. A comparison of sum of nested frequency values for perennial grasses from 1998-2002 on the Jericho fire rehabilitation studies.

It is important to note that the seed mix used for these studies was different. The state section was seeded with two perennial grasses and two forbs. The BLM section was seeded with four perennial grasses and no forbs. Although both sites had nearly the same number of total pounds/acre of seed applied, a total of 8 pounds of grass seed/acre were seeded on the state section, while 9.1 pounds of grass seed/acre were seeded onto the BLM site. The difference in pounds/acre of perennial grass seed applied on these sites may account for at least some of the difference in nested frequency and cover between the two treatments. However, the chaining treatment on the BLM site is likely responsible for increased nested frequency and cover values of perennial grasses as well.

Initially, cheatgrass was very abundant at the Jericho sites (Figures 3 and 4). It is interesting to note that in 1998, cheatgrass had higher percent cover and nested frequency values on the BLM site which was chained compared to the state section which was not. However in 2002, five years following the treatments, nested

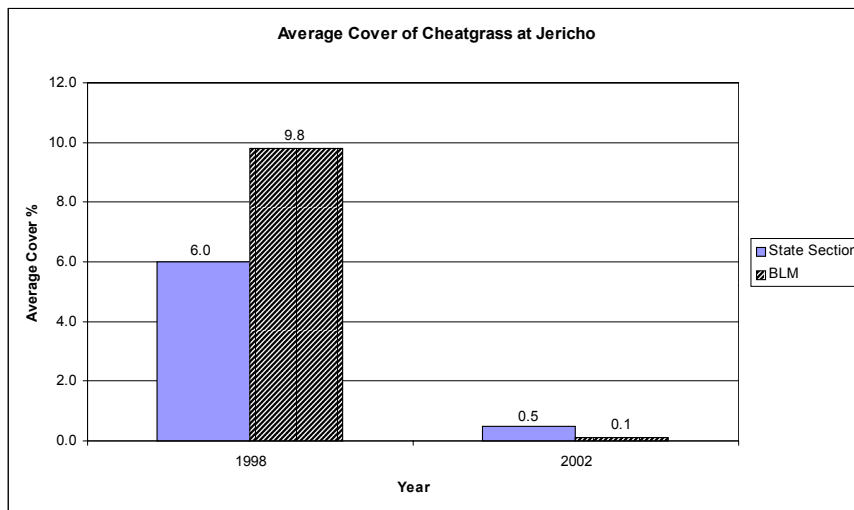


Figure 3. A comparison of percent cover of cheatgrass from 1998-2002 on the Jericho fire rehabilitation studies.

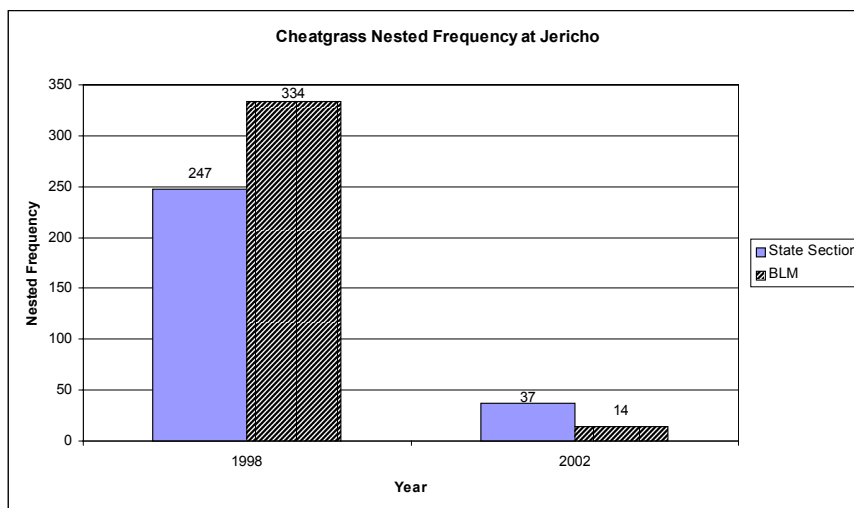


Figure 4. A comparison of cheatgrass nested frequency values from 1998-2002 on the Jericho fire rehabilitation studies.

frequency and percent cover of cheatgrass were slightly higher on the state section, although both parameters were greatly reduced on both sites with drought conditions in 2002.

Very few forbs occur on the BLM site, but no forbs were seeded on this treatment. The state section initially ('98) had a very high cover of forbs due to the abundance of two seeded species, alfalfa and yellow sweet clover. In 2002, alfalfa was still moderately abundant but yellow sweet clover was not sampled. Yellow sweet clover is a short-lived species so this change is not surprising. Drought conditions and Mormon crickets in 2002 resulted in most of alfalfa plants being in poor condition on the state section.

Fourwing saltbush was seeded on the BLM site, while no shrubs were seeded on the state section. The fourwing saltbush population was noted as vigorous and increasing on the BLM site in 1998, but in 2002, the population decreased and most of the population was classified as decadent and having poor vigor. With no young in the population in 2002, this population is in danger of decreasing further and may disappear from the site altogether. No shrubs were sampled on the state section in either sample, and due to the distance of any native seed source, it will remain so in the future unless shrubs are seeded into the site.